The Professional Medical Journal
www.theprofesional.com

ORIGINAL PROF-2575

BILATERAL IRREVERSIBLE BLINDNESS

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Article received on:
02/07/2014
Accepted for publication:
27/09/2014
Received after proof reading:
15/12/2014

ABSTRACT...Objective: To find out the causes of bilateral irreversible blindness in patients of different age groups in District Swabi. **Design:** It is a prospective observational study of one hundred and eighty nine consecutive blind cases. **Place and Duration of Study:** The study was conducted from July 2010 to June, 2012 at the Ophthalmology Department of District Headquarter Hospital, Swabi. **Subjects and Methods:** Informed consent was taken from the patient or guardian of the patient. Patients fulfilling inclusion and exclusion criteria were included in the study. A standard proforma was designed and entries were made regarding present, past and family history, thorough ocular examination of every patient was performed on slit-lamp with relevant biomicroscopic aids and posterior segment examination was conducted with direct as well as indirect ophthalmoscope. Biomicroscopy was performed as and when required. Intraocular pressure using schiotz tonometer, corneal diameters, retinoscopy and ocular mobility were noted and relevant investigations were performed when needed. Children and mentally retarded patients were examined using short general anaesthesia. **Results:** Of 189 patients 61.4% were males and 38.6% were females. Congenital Causes were present in 49.7% and acquired causes in 50.3%. Diseases accounted for 88.9%, trauma in 10.1% and unknown causes in 1.1% cases. Congenital diseases included congenital glaucoma in 35.1%, retinitis pigmentosa in 29.7% and albinism in 19.1% cases. Acquired diseases included primary glaucoma in 33.8%, diabetic retinopathy 23 %, secondary glaucoma in 17.5% and childhood infection in 10.8% cases. Corneal findings included corneal opacity in 31.2%, corneal edema in 4.8% and absent cornea in 7.4%. Optic nerve findings included optic atrophy in 16.4%, glaucomatous optic atrophy in 16.9%, new vessels in 9.5%. Retina findings included retinal dystrophy in 14.3%, maculopathy in 5.3%, chorioretinopathy in 0.5%, vascular retinopathy and hypopigmentation in 9.5% each respectively. **Conclusions:** Irreversible blindness is more common in children and young adults and mostly males are affected. Glaucoma is the commonest cause followed by retinitis pigmentosa and albinism in this study.

Key words: Irreversible blindness, Glaucoma.

Article Citation: Iqbal A, idrees M, Bashir B. Rehman M, Orakzai OK. Bilateral irreversible blindness in District Swabi. Professional Med J 2014; 21(6):1258-1263.

INTRODUCTION

Blindness, a major health problem has received little attention in under developed countries where the vast majority of world's blind live. According to WHO estimates, 45 million people are blind globally[1], 2 million in Latin America, 6 million in Africa and 20 million in Asia[2]. In Pakistan, about 2 million people are blind and blindness rate is 1.08 % 2. The prevalence of blindness in Khyber Pakhtoonkhwa is 1%[3]. District Swabi has a population around 1.8 million. The disabled persons constitute 3.6% of the total population. The disability is classified as blind, deaf, mute, crippled, insane and mentally retarded[4].

METHODS

We studied 189 consecutive blind cases attending Ophthalmology Department at District Headquarter Hospital, Swabi from July 2010 to June 2012. Blindness was defined as best corrected visual acuity of <3/60 (<20/ 400) in the better eye according to the 'Strategies for the Prevention of Blindness, National Plan, WHO, 1997. Patients with best corrected visual acuity better than 3/60 in better eye, uniocular blind patients, unwilling and uncooperative patients were excluded from the study. Informed consent was taken from the patient or guardian of the patient. A standard proforma was designed and entries were made regarding detailed history,

which included relevant personal data, onset of disease, duration and severity, past history of usage and change of glasses, trauma, inflammatory conditions, consultations with ophthalmologists and medications were recorded. Family history of diseases was inquired. Patients were specifically asked about any systemic disease like diabetes mellitus and hypertension.

Best corrected and uncorrected visual acuity was measured both for distance and near. Different tests were performed depending upon age of the patient by a trained ophthalmic technician as follows;

1. Less than three months old by head turn to light reflex.
2. 3- 24 months old with preferential looking.
3. 2- 3 years old with matching tests.
4. 3- 4 years old with Kay pictures.
5. 4- 5 years old and adults with Snellen "E" chart.

Examination of adnexa was recorded. Anterior segment was examined on slit-lamp with relevant biomicroscopic aids, while posterior segment examination was conducted with direct and indirect ophthalmoscopes. Biomicroscopy was performed as and when required. Intraocular pressure using schiotz tonometer, corneal diameters, retinoscopy and ocular motility were also noted. Relevant investigations were performed where needed. Children and mentally retarded patients were examined under short general anaesthesia.

Data was then entered and analyzed using SPSS version 20, frequencies and percentages were calculated.

RESULTS

This was a hospital based prospective observational study. Total of one hundred and eighty nine patients attending the Out Patient Department were noted in two years.

Out of one hundred and eighty nine patients, 33.9% (n=64) patients were in the age range of 1-15 years. Males were 61.4% (n=116) and females were 38.6% (n= 73). Age and sex distribution is shown in (Table I).

Age in years	Sex of patient		Total
	Male	Female	
1- 15	36	28	64 (33.9%)
16- 30	35	12	47 (24.9%)
31- 45	25	16	41 (21.7%)
45- 60	20	17	37 (19.6%)
Total	116	73	189 (100.0%)

Table-I. Age and Gender Distribution.

Regarding nature of blinding diseas, results showed that 49.7% (n=94) patients were having congenital diseases whereas, 50.3% (n= 95) were having acquired diseases. Nature of blinding diseases and gender distribution is shown in (Table II).

Nature	Sex of patient		Total
	Male	Female	
Congenital	60 (31.7%)	34 (18.0%)	94 (49.7%)
Acquired	56 (29.6%)	39 (20.6%)	95 (50.3%)
Total	116 (61.4%)	73 (38.6%)	189 (100.0%)

Table- II. Nature of disease and Gender Distribution.

Overall, common cause of blindness was due to different diseases affecting eyes and/ or multiple organs comprising 88.9 % (n= 168) patients followed by trauma in 10.1 %(n= 19) patients and unknown cause in 1.1% (n= 2) patients. Cause of blindness and gender distribution is shown in (Figure-1).

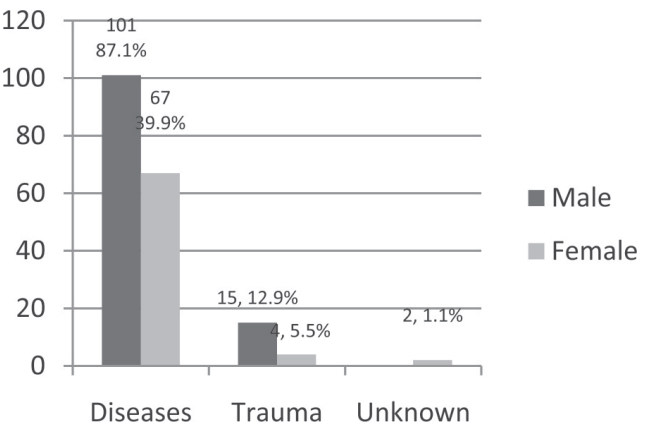

Figure- 1. Causes of irreversible blindness and Gender Distribution.

Regarding congenital diseases causing irreversible blindness, congenital glaucoma was more common in 35.1 % (n=33), retinitis pigmentosa in 29.7% (n=28), albinism in 19.1% (n=18), Stargardt disease in 8.5% (n=08), uveal coloboma in 3.2% (n=03). Congenital diseases and sex distribution is shown in (Table III).

Nature	Diseases	Sex of patient		Total
		Male	Female	
Congenital 94, 49.7%	Albinism	14	4	18 (19.1%)
	Aniridia	1	1	2(2.12%)
	Anophthalmos	1	1	2(2.12%)
	Coloboma	1	2	3(3.2%)
	Congenital Glaucoma	23	10	33 (35.1%)
	Retinitis Pigmentosa	16	12	28 (29.7%)
	Stargardt Diseas	4	4	8(8.5%)
	Total	60	34	94 (100.0%)
Acquired 95, 50.3%	Childhood Infection	6	2	8 (10.8%)
	Diabetic Retinopathy	6	11	17(23.0%)
	Primary Glaucoma	21	4	25(33.8%)
	Secondary Glaucoma	5	8	13(17.5%)
	Trachoma	1	6	7 (9.4%)
	Vit A Deficiency	2	2	4 (5.5%)
	Total	41	33	74 (100.0%)

Table-III. Diseases and Gender Distribution.

Acquired diseases causing irreversible blindness, primary open angle glaucoma was more common in 33.8% (n=25), diabetic retinopathy in 23.0 % (n=17), secondary glaucoma (steroid induced glaucoma and neovascular glaucoma) in 17.5% (n=13), childhood infection in 10.8% (n=08) and trachoma in 9.4% (n=07). Acquired diseases and sex distribution is shown in (Table III).

Traumatic globe injury causing irreversible blindness was present in 10.1% (n=19) patients. Road traffic accident in 47.4% (n=09) patients, firearm in 21.1% (n=04), bomb blast and chemical splash in 10.5% (n=02) each. Traumatic injury and sex distribution is shown in (Table IV).

Cause	Sex of patient		Total
	Male	Female	
Bomb Blast	02	00	02 (10.5%)
Road Traffic Accident	07	02	09 (47.4%)
Firearm Injury	04	00	04 (21.1%)
Neurosurgery	00	01	01 (5.3%)
Chemical Splash	02	00	02 (10.5%)
Burns	00	01	01 (5.3%)
Total	15	04	19 (100.0%)

Table-IV. Traumatic causes and Gender Distribution.

Regarding corneal causes of blindness, corneal opacity was present in 70.7% (n=58) patients, corneal edema in 12.2% (n=10) patients and absent globe in 17.1% (n=14) patients. Status of cornea and sex distribution is shown in (Table V).

Blindness due to optic nerve involvement comprised glaucomatous optic atrophy in 33.7% (n=32), optic atrophy in 32.6% (n=31) and new vessels on disc (NVD) in 18.9% (n=18) patients. Condition of optic disc and sex distribution is shown in (Table V).

Blindness due to posterior segment involvement comprised retinal dystrophy in 32.2% (n=29), maculopathy in 11.1 % (n= 10), Vascular retinopathy and hypopigmentation in 20% (n=18) patients respectively. Posterior segment involvement and sex distribution is shown in (Table V).

Anatomical Location	Signs	Sex of patient		Total
		Male	Female	
Cornea	Opacity	36	22	58
	Edema	05	05	10
Optic Nerve	Atrophic	17	14	31
	Cupped Atrophic	24	08	32
	New Vessels	06	12	18
Retina	Dystrophy	16	13	29
	Maculopathy	05	05	10
	Chorioretinopathy	01	00	01
	Vascular retinopathy	06	12	18
	Hypopigmentation	14	04	18
Absent Globe	Evicerated Eye	12	02	14

Table-V. Anatomical location and Gender Distribution.

DISCUSSION

In Pakistan, around 2 million people are completely blind and blindness rate is 1.08%[2]. In this study, acquired causes (50.3%) are more common than congenital causes (49.7%). This is in agreement with Wajid SA et al[5] who reported acquired causes in 91% and congenital causes in 6%.

In this study glaucoma is the most common diseas, present in 37.5 % (n= 71) cases. This is in agreement with Wajid SA et al[5] who reported glaucoma in 40 % cases. The studies of Rosenburg[6], Balatsoukas[7] and Quigley[8] documented glaucoma to be the second most common cause. Studies conducted by Dineen B et al[9] and Memon MS et al[10] reported glaucoma in 7.1% and 3.9% cases respectively declaring glaucoma as 4th common cause of irreversible blindness. The difference may be due to the fact that the sample size in these studies was very large as compared to our study.

Among glaucoma patients, primary glaucoma (open angle and close angle) is present in 35.2% (n=25) cases. This is contrary to Pechucho AM et al[11] who reported primary glaucoma in 50.2% cases and Wajid SA et al[5] who reported it in 70% cases. Poverty, unawareness and delay in seeking treatment are the major factors responsible.

Congenital glaucoma comprises 46.4% (n=33). This is contrary to Wajid SA et al[5] and Pechucho AM et al[11] who reported it in 25% and 7.6% cases respectively. Poverty, cousin marriages, multiparity, false beliefs and traditional medicines use all account for the high number of congenital glaucoma in our study.

Secondary glaucoma is present in 18.3 %(n=13) cases including steroid induced and neovascular glaucoma. Wajid SA et al[5] reported secondary glaucoma in 5% cases, all had neovascular glaucoma whereas, Pechucho AM et al[11] reported 33.4% cases of secondary glaucoma including lens induced, steroid induced and neovascular glaucoma. Poor management of chronic uveitis, diabetes, hypertension and other diseases leading to neovascular glaucoma[12] and use of unsupervised topical steroids for ocular surface allergies are possible causes of high prevalence of secondary glaucoma in our study.

Corneal blindness is present in 30.7% (n=58) cases. Corneal opacity is present due to congenital glaucoma in 56.8 %(n=33), childhood infection in 13.8% (n=8), trachoma in 12 %(n=7), trauma in 10.3% (n=6) and Vitamin- A deficiency in 6.8% (n=4). Dineen B et al[9], Memon MS et al[10] and See JLS et al[13] reported corneal opacity in 11.8%, 12.6% and 2.6% respectively. Memon MS et al[10] reported corneal opacity in Khyber Pakhtoon Khwa as 16.5%. Poor socio economic status, lack of education, malnutrition, overcrowding, poor hygiene, communicable eye diseases, traditional

medicines use, lack of preventive public health, poor maternal performance during pregnancy and lactation, inadequate birth control, poor immunization and inadequate eye care services all contribute to high percentage of corneal blindness in our study.

Diabetic retinopathy accounts for 9% (n=17) cases. This is in agreement to Dineen B et al[9] who reported 0.2% of diabetic retinopathy in his study. Wajid SA et al 5 reported high prevalence of 33% cases. His finding was also supported by studies of Khan MD et al[14] and Herse & Gothwal[15]. Some of the reasons to explain this difference in the prevalence rates may be lack of awareness, inadequate health facilities and financial constraints.

Fundus dystrophy is reported in 30.1% (n=57) cases. The most common is retinitis pigmentosa in 49.1% (n=28) cases followed by albinism in 31.5% (n=18), stargardt diseas in 14 % (n=8) and uveal coloboma in 5.2% (n=3) cases. Wajid SA et al[5] reported retinitis pigmentosa in 3% cases whereas 14.4% prevalence rate was reported in a survey conducted in district Swabi[4].Factors responsible are illiteracy, cousin marriages, social constraints, poverty and multiparity.

Trauma is reported in 9% (n=17) cases. Road traffic accident being the most common in 47.4 %(n= 9) followed by firearm injury in 2.1 %(n=4). Males are predominantly affected with male to female ratio of 3.7: 1. This is in agreement with Wajid SA et al[5] who reported trauma in 70% cases with male predominance. This finding is also documented by Khan MD et al[16] and other workers with male predominance. The important factors in trauma related blindness includes lack of education, awareness, preventive strategies and health care facilities.

Blindness due to unknown or unidentified causes is reported in 1.1 %(n=2). This is in agreement with Wajid SA et al[5] who reported it in 6% cases. It has also been reported that in about 13% cases etiology is unknown and in other 13% cases if good services are available, it could have been avoided[17].

CONCLUSIONS

From this study following conclusions are made:

1. Irreversible blindness affects all age groups but is more common in young age with male predominance.
2. Among the known etiologies, glaucoma turns out to be the commonest followed by corneal blindness and fundus dystrophies.
3. Basic reason behind majority of cases is poverty, illiteracy, lack of health care, false beliefs, traditional practices and treatment delay.

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